Fire Program Analysis – Preparedness Module
Airtanker Fixed Costs

Issue: To model the use of airtankers within the FPA system it is necessary to appropriately capture their preparedness cost (fixed cost component). No method has yet been developed to provide these costs to the system.

Background: FPA system use both fixed and variable costs as part of the optimization modeling. Providing both major cost components to the system is crucial to maintaining analysis integrity. Fire resources in the Budgeted category have had both cost components developed. In some instances all of the cost components for non-budgeted or loaned resources have not been developed. Failing to provide preparedness costs may result in a bias toward the use of non-budgeted or loaned resources as the system will see them as cheaper than the same resources tagged as a budgeted resource. A related issue was presented previously and related to indirect costs that a budgeted resource would incur but a non-budget resource would not.

Most airtankers are loaned resources by definition. The modeling of these fire resources is a special case; because their preparedness budgets do not associate with the FPU being analyzed.

Large Airtankers (Type 1 & 2) The FPA system requires an annual fixed cost to use for modeling all fire resources, including large airtankers. This group of resources is the National Shared Resource (NSR) Airtankers, which are nationally contracted with a national mission. Even though this cost does not become a part of the preparedness budget for the FPU, the system shouldn't see these resources as 'free' with regard to fixed costs in relation to other fire resources. Otherwise it may inappropriately view airtankers as cheap choices without regard to the real cost. Large airtankers will likely serve many FPUs and it is important that the appropriate costs be captured for modeling, neither too cheap nor prohibitively expensive.

Type 3 & 4 Airtankers The smaller airtankers can be funded nationally (loaned resources) or funded locally (budgeted resources). There are a significant number of Type III airtankers contracted to the BLM national office and stationed throughout the western U.S. This effort is often referred to as the Single Engine Airtanker (SEAT) program. Fixed costs could be developed similar to the large airtankers. These aircraft are contracted nationally, but the mission scope is distinctly more local.

There are also several instances of Type III or IV airtankers being contracted locally. The actual costs associated with these aircraft should be developed locally and shared with the FPU partners.

The federal agency fire planning leads should be contacted if there uncertainty about how to model airtanker usage in your fire planning unit.

Alternative 1 Apportion historic costs to the units. Have national leads for airtankers provide a percentage of airtanker usage by the resource type and by unit ID for the country. This should be an average of the last five years, since any individual year might be dramatically skewed. (This could be supported by the AMIS database, and the last 5 years has higher quality data.)

Each airtanker's annual cost would then be apportioned to the organizational units proportional to their use. The partner units within an FPU would add together their share of the airtanker and base costs. This total would then be used as the figure the FPU would include as their 'cost' when defining the cost of an airtanker.

There are four disadvantages with this method; 1) it is biased toward recent historic airtanker use, 2) it is unlikely the data could be developed prior to the October 1, 2004 deadline, 3) data input to the lookup data would be much more labor intensive, and 4) the data would inappropriately include large fire costs.

Alternative 2 Apportion historic costs to the FPU. Have agency leads provide usage based on AMIS data. The use for organizational units would be associated with FPUs, and the total number of FPUs served by the airtanker would be defined. The total cost of the airtanker would simply be divided by the number of FPUs served. (Example - airtanker A serves five units represented in three FPUs. The annual airtanker and base costs would be divided by 3, and that cost would be used.

This has the same disadvantages as alternative 1.

Alternative 3 Apportion national contract costs. This is the very simplest approximation of airtanker fixed costs. The total large airtanker program costs are divided by the number of large airtankers provided. Example: Thirty-three large airtankers are provided at a program cost of approximately $15 million. Preparedness cost per airtanker would be $450,000; and would be applied to each airtanker analyzed in each FPU.

This approach meets the system need to provide the fixed cost to be applied within the model for any analysis that uses a large airtanker, regardless of their past use. This cost could include the annual fixed cost for airtanker bases. Fixed cost would then represent the cost to use a large airtanker.

There is a trend toward full service contracts, where all of the service is provided under contract, rather than split between the contractor and the government. By assuming full service contracting of retardant delivery the preparedness cost for the Airtanker Base is included within the strategic modeling.

Analysis of Alternatives All three alternatives were reviewed by Dr. Douglas Rideout for consistency and adherence to economic principles. They all suffer from the same flaw, that they are subjective decisions. It was concluded that no other cost apportionment scheme would be any less subjective.

The system's need for fixed costs could be met by any of the alternatives.

Recommendation: Use alternative 3. It is the most simple, but may be adequate in the short term to meet the system need. A more robust alternate may take too long to develop to meet short term needs, but should be considered for the long term. The example of large airtanker preparedness costs of $450,000 seems quiet large, and therefore could be a bias against using airtankers in FPU analyses. The core team does not believe that a cost figure of this magnitude would preclude airtanker use within the model.

This one fixed cost for large airtankers can easily be input to the system through a lookup table managed by the data administrator. Likewise, a single value could be used to represent the Type III Airtankers.

The preparedness cost used for strategic modeling should not be confused with the actual preparedness budget that is appropriated and allocated. The preparedness costs generated during an analysis would not be reported out as part of the out-year budget formulation. In post-optimization these costs would removed from any budget formulation at the fire planning unit level. The costs for national programs are added at the national level.

Other Issues

Sensitivity testing of the recommendation is needed. How sensitive is the model to changes in the Airtanker preparedness cost? The fixed cost calculated by alternative 3 should be tested first, and the additional fixed cost values could be tested. Hopefully a wide range of cost increments could be tested.

There have been many inquiries about modeling airtankers, specifically related to tactical issues of availability and priority setting. There has been another concern that the strategic analysis could over utilize the airtanker resource. In the IIAA software airtanker use on low FIL fires could be turned off. In FPA there is no mechanism to limit the use of airtankers by FIL or time of year.